

Arctic Fox



POLAR
PAM
3676

POLARPAM

opus]

The arctic fox (*Alopex lagopus*) or white fox as it is often called, is a member of the canid family and is related to other foxes, wolves and dogs. Found throughout the arctic circumpolar lands, in Canada it ranges from the northern tip of Ellesmere Island to Churchill, Manitoba, the southern limit of the tundra. The wide distribution of this fox in the severe arctic environment is due to its excellent adaptation to cold and to widely variable food sources and food supply.

Appearance and adaptation

The arctic fox weighs from 2.5 to 9 kilograms (5.5 to almost 20 lb) and measures between 75 and 115 centimetres (30 and 45 in.) in length, making it the smallest wild canid in Canada — about the size of a large cat. The tail is long and bushy making up between 30 and 35 percent of its total length.

Over the winter the arctic fox has a heavy white coat, but during May, when early summer temperatures begin to melt the snow cover, the coat is shed for a thinner, two-tone brown pelage. A few weeks later the back, tail and legs are dark brown and the remaining underparts are a buff colour. A small proportion of this species has a heavy, pale bluish-grey coat in winter which becomes thinner and darker bluish-grey in summer. The blue coloration (blue fox) occurs in almost all populations, although the proportion tends to be higher in those animals living in marine areas which remain mostly ice-free during winter. In Canada blue foxes seldom make up more than 5 percent of the animals that are trapped, whereas in Greenland, for example, the proportion of blue foxes may reach 50 percent.

The arctic fox is superbly adapted to the arctic environment. The compact body form, short snout and short, rounded, well-furred ears minimize heat loss from body extremities. The deep, thick pelage of very fine hair, and the hair on the soles of the feet provide insulation of such good quality that increased energy consumption to

maintain body warmth is required only in very cold temperatures. Even in winter, arctic foxes seldom seek shelter during their extensive searchings for food, except during severe storms when they will dig a hole in a snow bank or search out a breeding den site.

The voice of the arctic fox does not resemble the bark or yap that is characteristic of other canids; it is best described as a high-pitched, undulating whine. It is a sound rarely heard and seems to be associated mostly with territorial claims in relation to neighbouring arctic foxes and other species of mammals.

Diet

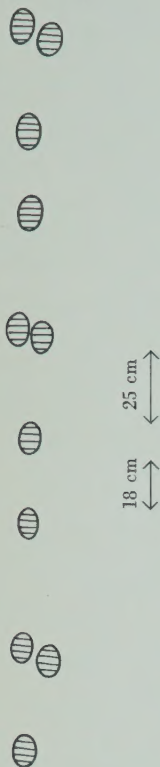
The diet of the arctic fox is extremely varied throughout its range, related as it is to regional geographic characteristics and seasonal fluctuations in food supply. Microtine rodents, such as lemmings, ground squirrels and voles, are an important component of the diet. During summer, nesting and other adult birds, eggs and flightless young also make up a large part of the diet. Those foxes inhabiting marine regions also hunt for small marine animals, fish and carrion along shorelines. During winter these foxes venture onto the sea ice where they frequently trail polar bears for the remains of seal kills, and seek out seal dens in order to capture the pups. Some foxes live close to major seabird colonies; there they raid nests for eggs and capture hundreds of birds which they cache for food in winter.

In the vast expanses of the continental tundra region the arctic fox is almost entirely dependent on lemmings throughout the year. In the central portion of the District of Keewatin, for example, only 5 to 10 percent of the summer diet is composed of birds, eggs, ground squirrels and berries. In winter, the fox continues its search for lemmings which are active under the snow, often covering great distances over many hours. Other winter food items include the meat caches of Inuit trappers, wolf kills and food cached by the fox during the summer.

Population cycles

The number of arctic foxes, especially in populations dependent upon lemmings for the major portion of their diet, fluctuates widely in relation to the abundance of lemmings. Although the fluctuation in lemming numbers, which occurs every three to four years in North America, is not as well understood as those in Scandinavian countries, it is no less dramatic. Population size may vary ten or twenty-fold between years, and hundred-fold increases are not uncommon at a peak in the lemming cycle. During those years when lemmings are plentiful, many foxes survive the long winter, a large proportion of the population breeds the following spring, and the litters are raised successfully. Hence a peak in the arctic fox cycle is recorded the following winter.





A characteristic of the lemming cycle is the "crash", the sudden decrease in population which may be caused by poor weather, lack of food, stress or predation, or to a combination of these factors. Faced with a rapidly depleting food supply, the arctic fox may be forced to abandon customary hunting areas and to travel, often hundreds of miles, in a nomadic search for food. Often many foxes travel in the same direction and their movements are termed migrations. In Canada little is known of the direction of the migrations or the number of animals that may be involved; however, the intensity and scope of fox migrations in the USSR is well known. During a lemming crash, fatigue, the intense cold, and especially the lack of food takes its toll on the population and many young foxes succumb. Native traplines, hunters and diseases such as rabies and mange also contribute to the population reduction. The following spring the remaining foxes are weak, a smaller proportion of the population breeds and fewer breeding pairs raise all their whelps successfully. When the lemming population is low, the food demands of the growing litter often cannot be met by the adult foxes. As a consequence, the adults may abandon the litter, leaving the whelps to starve to death, or the whelps may fight among themselves and kill each other, thereby reducing the food demands of the litter to a level that can be supplied by the adults.

The very high reproductive potential of the arctic fox is an adaptation to take advantage of the extreme variability in abundance of its main food source — the lemming. Successful reproduction, accompanying a peak in the lemming cycles increases the fox population tremendously, enabling it to survive the lemming crash and the following two or three years of marginal reproductive success.

Breeding and denning

About two months before the end of winter, arctic foxes begin to pair up and mating occurs. Throughout the females' 51–57 day pregnancy, the pair remains together and a den is found for raising the whelps. Den sites are typically located on the tops or sides of eskers, or on the tops of lake or river banks where the soil is sandy, dry and stable. The den sites are usually free from snow earlier than the surrounding landscape because of the good drainage. Dens may be up to 300 years old and may possess as many as 100 entrances. Before the birth of the whelps, both adults share the responsibility for cleaning out a portion of the den and digging one or more new entrances.

The whelps

Litters of arctic foxes are born between late May and early June. The mean litter size is about 11 whelps or pups. It is the largest litter recorded

for any canid, double the mean value for the red fox and the highest of any wild mammal in the world. Litters of up to 22 whelps have been recorded in the USSR. At birth the whelps are blind, helpless, covered with hair and weigh about 57 grams (2 oz).

Compared to other canids the male fox is probably one of the most attentive and best providers of food during the denning period. Just before the birth of the whelps and while the female is spending her time nursing and caring for the litter, the male actively hunts food for her. After five or six weeks when the whelps are weaned, the female begins to share the hunting duties with her mate and gradually provides well over half of the food to the growing litter. Although the amount of food provided by the male gradually decreases, he continues to bring food to the den site until the whelps begin to leave the den about 14 to 15 weeks after birth.

The large litter size and rapid growth rate of the whelps keeps the adults busy hunting for food. For an average litter of 11 whelps just starting to eat solid food, about 30 lemmings are required per day. The demand increases to over 100 lemmings per day just before the whelps leave the den. About 3,500 to 4,000 lemmings are consumed by the adults and young during the denning period.

Hunting

In order to satisfy the food requirements of their whelps, the adults hunt throughout the sunlit arctic night from 4 p.m. to 10 or 11 a.m. the following morning. Ten to fifteen hunts are usually carried out by each of the adults and from three to eight lemmings are brought back from each hunt. When lemmings are abundant the foxes hunt over an area of 2.5 to 5.0 square kilometres (1–2 mi²). However, when food is scarcer, the adults probably range much farther. Lemmings are captured by digging them from their nests located in soft peaty hummocks. Lemmings which are active in open tundra covered with low-lying or sparse vegetation are captured with a quick dash and a pounce; those detected in areas of low bush are pounced on as the fox slowly stalks through the bush. Arctic foxes sometimes attack sandhill cranes and geese but are seldom successful against such large prey. The foxes also search along the edges of lakeshores during June in anticipation of flushing a duck, goose or shorebird from the nest and eating the eggs.

Enemies

Adult arctic foxes or their young have few enemies other than man. Wolves will eat a fox if they can catch one or find one caught in a trap. Where their ranges overlap, arctic foxes and red foxes (*Vulpes vulpes*) compete for den sites and hunting habitat along the sparsely treed southern fringes of the tundra. Golden Eagles may be a

Rec'd: FEB - 3 1987
Order No.:
Price:
Acc. No. gift

threat to young whelps at the den site, and barren ground grizzly bears and wolves are capable of digging whelps or adults from the den.

Fur industry

In Canada, the beautiful and valuable pelt of the arctic fox is an important source of income to northern native people. On Banks Island, trapping for arctic fox is actively pursued and the harvest provides a prosperous living to trappers from Sachs Harbour. Before the increase in popularity of natural furs in the garment industry, untanned pelts cost about \$10; now, however, prices are about \$40 to \$50 for a prime pelt. Despite this large increase in price, trapping for arctic fox and other fur-bearers in northern Canada has gradually decreased over the past several years. About 40 years ago, arctic fox ranches were established when the demand for long-haired furs had pushed prices up to \$300. These ranches were of two types: those on small islands where the animals ran at liberty, and those having pens. Foxes on these ranches were often selectively bred. Few, if any, arctic fox ranches remain in Canada today. Ranching is more common in the USSR where the whelps are live-trapped at den sites and caged until their coat is prime for pelting.

Management

The only management controls on the arctic fox are the dates set for the trapping season. There are no restrictions on the number of foxes that may be trapped or the location of trapping areas. Surveys of important denning regions could be carried out to accurately estimate the trapping harvest and determine the abundance of arctic foxes. With decreasing trapping pressure, however, the relative abundance of lemmings serves as a suitable indicator of arctic fox populations.

Reading list

- Bannikov, A. G. 1969. Arctic fox in the U.S.S.R.: biological premises of productivity. *In* Productivity and conservation in northern circumpolar lands. W. A. Fuller and P. G. Kevan (eds). IUCN publ. New Ser. 16. Morges, Switz. 1970.
- Krebs, C. J. 1964. The lemming cycle at Baker Lake, Northwest Territories, during 1959-1962. Arctic Inst. of N. Amer. Tech. Pap., No. 15, 104 pp.
- Macpherson, A. H. 1969. The dynamics of Canadian arctic fox populations. Can. Wildl. Serv. Rep. Ser. No. 8, Ottawa. 52 pp.
- Speller, S. W. 1972. Food ecology and hunting behaviour of denning arctic foxes at Aberdeen Lake, Unpub. Ph.D. Thesis, Univ. of Sask., Saskatoon. 145 pp.
- Walker, E. P. *et al.* 1964. Mammals of the world. Vol. 2. John Hopkins Press, Baltimore. 1500 pp.

99999
Pam:599.742.1[Alopes Lagopus]
SPE

SPELLER, S.W.
Hinterland who's who

Date Due

Borrower's Name

99999
Pam:599.742.1[Alopes Lagopus]
SPE

SPELLER, S.W.
Hinterland who's who

Boreal Institute for Northern
Studies Library
CW 401 Bio Sci Bldg
The University of Alberta
Edmonton, AB Canada T6G 2E9

Fisheries and Environment Pêches et Environnement
Canada Canada

Issued under the authority
of the Minister of Fisheries
and the Environment
© Dept. of Supply and Services,
Ottawa, 1977
Catalogue No. CW69-4/58
ISBN No. 0-662-00399-3
Text: S. W. Speller
Photo: G. R. Parker
Design: Gottschalk + Ash Ltd.